

REMARKS

Claims 1-9 are pending in this application, of which claims 1-7 have been amended and claims 8-9 are newly-added.

Claims 3-7 stand rejected under 35 USC §112, second paragraph, as indefinite.

Accordingly, claims 1-7 have been amended to correct the noted instances of indefiniteness, and the 35 USC §112, second paragraph, rejection should be withdrawn.

Claim 1 stands rejected under 35 USC §102(e) as anticipated by U.S. Patent 6,052,285 to Hileman (hereinafter "**Hileman**").

Applicant respectfully traverses this rejection.

The Examiner urges that Fig. 6 does not show the heat pipe extending from the front surface of the motherboard via the through hole to the back surface of the motherboard.

Applicant respectfully disagrees.

Fig. 6 incorporates by reference features of Fig. 1. The specification at page 9, line 27, notes that the motherboard 160 is not illustrated in Fig. 6, but it is clear from the discussion of Fig. 6 starting on page 9, line 21, that Fig. 1 is incorporated by reference. The discussion on page 9 refers to many features of the motherboard 160 that are only illustrated in Fig. 1, including the front and back sides 162-164 and the through hole 166.

The specification discloses that the heat pipe 61 of Fig. 6 passes from one side of the motherboard to the other side. The text at page 9, line 21 states,

... heat pipe 61 ... may be extended to a back surface of the motherboard 160 using the through hole 166. This embodiment is shown in Fig. 6. ... The heat pipe 61 extends from the front surface

162 of the motherboard 160 via the through hole 166 to the back surface 164 of the motherboard 160. ... a portion under the intake 125 passes through the through hole 166 of the motherboard 160. The motherboard 160 is not illustrated in FIG. 6. The heat pipe 61 is coupled with exoergic elements ... indicated by 62 in the drawing at the back surface 164... This configuration allows the through hole 166 to double as an intake from the back surface 164 and a placement of the heat pipe.

The alignments of the various segments of the heat pipe 61 shown in Fig. 6 are consistent with the heat pipe 61 extending up through the hole 166. Starting at the exoergic element 62, the pipe extends parallel to the lower-right side of the fan-cum-heat sink 1100, then turns to extend in a vertical direction for a distance comparable to the thickness of the fan-cum-heat sink 1100, and then has two more extensions parallel to the sides of the fan-cum-heat sink 1100, then a shorter vertical extension, and finally is attached to the fan-cum-heat sink 1100 (the last two extensions are shown in solid lines). The first vertical extension, which ends up at a position *under* the fan-cum-heat sink 1100, arguably comes from a lower elevation, i.e., under the motherboard 160.

The Examiner may be confused by the position of the heat pipe 61 under the fan-cum-heat sink 1100 in the intermediate extensions, because the Examiner is assuming that the fan-cum-heat sink 1100 is resting on the front surface 162 of the motherboard 160. To the contrary, in Fig. 1, the CPU 150 (shown only in dashed lines) is mounted on a socket 151, and we would point out the text at page 8, line 1,

As in FIG. 1, the mounting grooves 123a and mounting holes 123b are pierced through the top and bottom surfaces 122 and 124, and are engaged with screws 170. The screws 170 may have a hollow body so as to be engageable with pins 172 pierced

through a socket 151 for placement of the CPU 150 provided on the motherboard 160. The socket 151 makes the CPU 150 exchangeable. ... any means for thermally connecting the housing 120 and the CPU 150 is applicable. For instance, the both elements may be bonded with a thermally conductive adhesive or by soldering ...

which shows that the fan-cum-heat sink 110 of Fig. 1 (and therefore also the fan-cum-heat sink 1100 of Fig. 6) is not in contact with the front surface 162 of the motherboard 160, but instead is in contact with the CPU, so that a space between the bottom of the fan-cum-heat sink 1100 and the front surface 162 of the motherboard 160 exists through which the intermediate extensions of the heat pipe 61 shown in Fig. 6 can exist.

However, if the Examiner so requests, Applicant will supply a new print of Fig. 6 showing the board and the through-hole.

Thus, Hileman does not disclose the heat pipe that is disposed between the front surface and the back surface of the printed circuit board, via the through hole, and cannot cool both sides of the printed circuit board, as stated in the response to the previous Office Action, and the 35 USC §102(e) rejection should be withdrawn.

Claims 1-7 stand rejected under 35 USC §102(a) as anticipated by U.S. Patent 6,122,169 to Liu (hereinafter "Liu").

Applicant respectfully traverses this rejection.

Liu discloses a heat sink assembly comprising a conductive housing 32 having a through channel 38, and a heat pipe 36. The Examiner urges that a shielding portion 54 of the housing 32 to be the motherboard 160 of the present invention, and indicates that the heat pipe 36 is

disposed between a front surface and a back surface of the housing 35.

Applicants respectfully disagree.

Housing 32 is not a circuit board. In addition, the heat pipe 36 of Liu is arranged in the through channel 38 in the housing 32.

Therefore, Liu does not disclose the limitations "said circuit board including a through hole" and "a heat pipe disposed between said front surface and said back surface of said circuit board, via said through hole", as now recited in claim 1 of the instant application.

Thus, the 35 USC §102(a) rejection of claim 1, as well as 2-9 depending therefrom, should be withdrawn.

In view of the aforementioned amendments and accompanying remarks, claims 1-9, as amended, are in condition for allowance, which action, at an early date, is requested.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

U.S. Patent Application Serial No. 10/077,857

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP



William L. Brooks
Attorney for Applicant
Reg. No. 34,129

WLB/mla

Atty. Docket No. 001410A
Suite 1000, 1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



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PATENT TRADEMARK OFFICE

Enclosures: Version with markings to show changes made

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IN THE CLAIMS:

Please amend claims 1-7 as follows:

1. (Amended) A radiator mechanism comprising:
a circuit board, including a front surface and a back surface, on which an exoergic part is to be mounted, said circuit board including a through hole; and
a heat pipe disposed between said front surface and said back surface of said circuit board, via said through hole.
2. (Amended) The radiator mechanism according to claim 1, wherein at least a portion of the heat pipe runs parallel to the front surface and to the back surface.
3. (Amended) The radiator mechanism according to claim 1, [wherein the] further comprising a heat sink that comprises a cooling fin mounted on the front surface of the circuit board and a cooling fan disposed above the through hole.
4. (Amended) The radiator mechanism according to claim 3, wherein the cooling fan rotates around an axis perpendicular to said front surface of said circuit board, and absorbs air from said back surface of said circuit board.

5. (Amended) The radiator mechanism according to claim 4, wherein the cooling fan exhausts the air in a direction parallel to said front surface of said circuit board, whereby the air flows over said heat sink.

6. (Amended) The radiator mechanism according to claim 5, wherein the cooling fan and the heat sink are comprised in a fan-cum-heat sink unit.

7. (Amended) The radiator mechanism according to claim 5, wherein at least a portion of the heat pipe runs parallel to the front surface and to the back surface.